

Swedberg et al. or 5,658,413 to Kaltenbach et al. Although claims 23 and 24 were amended and claims 77 and 78 were added to clarify the inventive subject matter, the Examiner made final his previous rejection in this Office Action as well as additionally reject claims 77 and 78. The rejections are traversed for reasons which will be discussed in detail below.

THE 35 U.S.C. §102(B)/103(A) INHERENCY REJECTION OVER SWEDBERG ET AL. OR KALTENBACH ET AL.:

The Examiner has again rejected claims 23-27, 29-46, 48-50 and 52-59 under 35 U.S.C. §102(b)/103(a) as inherently anticipated by or obvious over either one of Swedberg et al. or Kaltenbach et al. Newly added claims 77 and 78 were also rejected. To support these rejections, the Examiner cited paragraph 4 of the previous Office Action. That is, the Examiner characterized laser ablative techniques as inherently providing a high surface area texturing of the substrate through a subtractive process. Moreover, the Examiner added that he does not have laboratory facilities with which to measure the surface roughness and corresponding surface area of the substrates of the prior art. Thus, the Examiner contends that "it is incumbent upon applicants to rebut the Examiner's allegation of inherency based on Swedberg et al. or Kaltenbach et al. with comparative evidence showing that the teachings of the prior art relied upon the Examiner do not anticipate and/or render the scope of the protection sought prima facie obvious."

Applicants disagree with the Examiner's contention that the cited references inherently anticipate or suggest high-surface area textured substrates as claimed. In addition to the comments the applicants submitted in response to the previous Office Action, applicants point out that while both Swedberg et al. and Kaltenbach et al. disclose laser ablation as a technique in which material may be removed from a substrate, neither patent discloses high-surface area texturing. For example, Swedberg et al. only discloses the use of laser ablation for forming features such as sample processing channels and apertures, not laser ablation for texturing. See column 14, lines 42-45. It is also disclosed that in a preferred embodiment, such channels are made having a semicircular cross-sections, and the channels may be used to form sample processing chambers having a highly symmetrical circular cross section that may be desirable for enhanced fluid flow. See column 14, lines 59-67. Thus, it is evident that laser ablation as disclosed in the cited patents is generally used to form smooth and regular features in microanalytical devices, not for texturing or increasing surface area. It is unclear, then, why the

Examiner believes that laser ablation inherently discloses or renders obvious an increase of surface area by at 10-fold to 100,000-fold as is now recited by the claims. Smooth surfaces are generally antithetical to a surface area increase. Moreover, even if a surface area increase were taught, the cited patents do not suggest an increase in surface area to such a large extent.

In addition, applicants direct the Examiner to FIG. 4A-H of the application. These figures are scanning electron micrographs of a Kapton® sheet laser ablated through various grayscale masks and exemplify surfaces having undergone the inventive texturing process. As is evident from these micrographs, material is removed from a generally rectangular section of the surface of the sheet through laser ablation. The surface within the rectangular section exhibits high surface-area texturing. As described on page 33, lines 8-13, the high surface area exhibited by these examples is achieved through "coning," a process in which cones are produced on a polymeric surface through laser ablation. While the precise degree of surface area increase has not been precisely measured, it is evident that a visual comparison of the unablated and ablated portions of the substrate surface indicates an enormous increase in surface area due to ablation. According to the declaration submitted herewith, inventor Reid Brennen estimates that the surface area of the ablated portion of the surface in all figures submitted is at least about one to five orders of magnitude greater than the corresponding unablated portion.

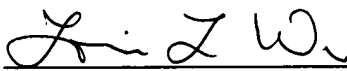
With respect to the Examiner's assertion that such an increase in surface area is inherently anticipated or obvious, applicants again direct the Examiner to the declaration submitted herewith. Prior use of laser ablation in order to form channels does not result in the invention as claimed. As shown in the FIG. 11 contained in Appendix B of the declaration, laser ablation of Kapton® sheets in order to form channels results in generally smooth channel surfaces. Smooth channel surfaces do not necessarily exhibit the degree of surface area increase required by the claimed invention. Thus, anticipation is an improper basis for rejecting the pending claims. While in some circumstances, a flawed ablation process may result in small surface imperfections and slight coning (*see, e.g.,* FIG. 12), such imperfections increase surface area by only a trivial amount. Such a trivial increase in surface area does not suggest an increase in surface area by at least 10-fold to 100,000 fold as is now claimed. Thus, it is evident that the Examiner's reliance on inherency as a basis for his rejection is misplaced and that the invention as claimed is both novel and nonobvious.

CONCLUSION

For all of the above reasons, it is submitted the pending claims define an invention that is patentable over the art. As the application is in condition for allowance, a prompt indication to that effect would be appreciated. Should the Examiner have any questions concerning this communication, he is welcome to contact Mike Beck at (650) 485-3864.

Respectfully submitted,

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Date

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